



#402

SKYLAB
CREW/VEHICLE DISTURBANCES

73-027A-42A



SKYLAB
SUMMARY OF EXP. T-013
73-027A-42A

THIS DATA SET HAS BEEN RESTORED. ORIGINALLY IT CONTAINED TWO 9-TRACK, 1600 BPI TAPES WRITTEN IN EBCDIC. THE ORIGINAL TAPES WERE STANDARD LABELED, THE LABELS WERE STRIPPED WHEN THE TAPES WERE RESTORED. THERE IS ONE RESTORED TAPE WRITTEN IN ASCII, THIS RESTORED TAPE IS NOT STANDARD LABELLED. THE DR TAPE IS A 3480 CARTRIDGE AND THE DS TAPE IS 9-TRACK, 6250 BPI. THE ORIGINAL TAPE WAS CREATED ON A CDC 6600 COMPUTER AND WAS RESTORED ON AN IBM 9021 COMPUTER. THE DR AND DS NUMBER ALONG WITH THE CORRESPONDING D NUMBER AND TIME SPAN IS AS FOLLOWS:

DR#	DS#	D#	FILES	TIME SPAN
DR005569	DS005569	D023662	1-2	08/16/73 - 08/16/73
		D030427	3-8	08/16/73 - 08/16/73

SKYLAB

CREW/VEHICLE DISTURBANCES

73-027A-42A

This data set consists of 2 D & C tapes. The first tape contains 6 files and the second tape has 18 files. The second tape is a continuation of the first tape. Both tapes are 1600, ~~EBCDIC~~^{ASCII}, 9 track and were created on the *CDC computer. The tapes are standard label. The tapes cover the period from HR 13:19:29 thru HR 16:27:53 on day 228 of year 1973. The tapes D & C numbers are listed below along with a partial format. Send copy of microfiche B26733-000A.

<u>D#</u>	<u>C#</u>	<u>FILES</u>	<u>TIME SPAN</u>
D-23662	C-19389	6	08/16/73
D-30427	C-19390	18	08/16/73

* The tapes were created on the CDC computer, however were written in 360 format.

B26732-000A

TITLE: EXPERIMENT T-013 DATA TAPE DESCRIPTION

A digital magnetic tape of much of the reduced T-013 data has been prepared and is described in this appendix. Inquiries concerning availability of these data should be addressed to:

National Space Sciences Data Center
National Aeronautics and Space Administration
Goddard Space Flight Center
Code 601
Greenbelt, MD 20771
Reference: NSSDC ID 73-027A-42A

The data tape was prepared by use of Control Data Corporation's (CDC) Model 6000 series digital computers and is described herein.

Data generated from processing the raw data from experiment T-013 are recorded in seven files on the magnetic tape designated W0045. This tape is a labeled, nine-track, 1600 bits per inch, phase encoded, CDC SCOPE 3.4 internal format tape. The tape has an ANSI-standard 80 character label. The "label" internal to the label is T-013, and the creation date is given as "75232" which means day 232 (20 August) of 1975. The seven files group as three logical units: a descriptive header file and a long data stream of FMU and vehicle forces and moments and astronaut body Euler angles; three files of smoothed astronaut center-of-mass and attitude data as functions of time; and a descriptive header file and a short stream of raw ATM rate gyro data.

The first two files are a header and a long data stream. The first file contains one 70-word record which was written with an unformatted write statement, and so may be read with an unformatted read statement, and may be interpreted with an A10 format,

DIMENSION HEADER (70)

.

.

.

READ (9) HEADER

.

.

.

PRINT 400, HEADER
400 FORMAT (5X, 7A10)

The second file, the data stream file, contains 3074 records of 512 words each, written by an unformatted write statement.

3 DIMENSION A (512)

7 WRITE (9) A

8 Each record contains 14 contiguous blocks of 35 words per time point (490 words of data
9 in each 512 word record). The blocks of 35 words contain the values of the following
10 forces, moments, and body Euler angles.
11

<u>Word</u>	<u>Parameter</u>
14 1	Time, in seconds from beginning of year (TGMT)
15 2-4	F_X , F_Y , and F_Z for FMU 1, in newtons
16 5-7	M_X , M_Y , and M_Z for FMU 1, in newton-meters
17 8-13	F_X , F_Y , F_Z , M_X , M_Y , and M_Z for FMU 2, in newtons and 18 newton-meters
19 14-19	F_X , F_Y , F_Z , M_X , M_Y , and M_Z for vehicle, in newtons and 20 newton-meters
21 20-35	γ_{21} , γ_{22} , γ_{31} , γ_{32} , γ_{41} , γ_{42} , γ_{51} , γ_{52} , γ_{61} , γ_{62} , γ_{71} , 22 γ_{72} , γ_{81} , γ_{82} , γ_{91} , and γ_{92} , in degrees

23
24
25
26
27 If these records are read by an unformatted read statement, they can be interpreted as in
28 an E-format.

29 DIMENSION A (512)

33 READ (9) A

34 PRINT 200, (A(I), I = 1, 490)

35 200 FORMAT (7 (5E25.15//))

36
37 Table XIII correlates certain activities of the T-013 experiment with time points in the
38 data stream and record numbers in the second file of tape W0045. The data stream in the
39 second file has had short data gaps filled by linear interpolation; the time span runs from
40 13:19:29 to 16:27:54 on day 228 (from TGMT 19747169 to 19758474).

TABLE XIII.- DOY 228 ACTIVITIES

	Start time	Time, sec	Activity	Initial record in file 2
3	15:19:25	19754365	Calibrate FMU 1	277
4	15:19:47	19754387	Calibrate FMU 2	293
5	15:20:30	19754430	Task 3, trial run	324
6	15:21:35	19754495	End trial run	370
7	15:26:00	19754760	Time correlation on FMU 2	559
8	15:26:50	19754810	Flapping arms	595
9	15:27:20	19754840	Flapping arms	617
10	15:28:01	19754881	Forceful squat thrust	646
11	15:29:19	19754959	Normal thrust	657
12	15:29:50	19754990	Forceful soaring	678
13	15:30:35	19755035	Normal soaring	711
14	15:33:45	19755225	Forceful soaring, two men	846
15	15:38:05	19755485	Forceful soaring, two men	1032
16	15:40:00	19755600	Film coverage starts	1114
17	15:45:12	19755912	Calibrate FMU 1	1337
18	15:46:04	19755964	Calibrate FMU 2	1374
19	15:46:55	19756015	Unscheduled swaying motion	1410
20	15:51:48	19756308	Time reference on FMU 2	1620
21	15:53:35	19756415	Start deep breathing	1696
22	15:54:07	19756447	5 coughs	1719
23	15:54:25	19756465	5 sneezes	1732
24	15:55:24	19756524	Astronaut at attention, LIMS reference	1774
25	15:55:25	19756525	Wave right arm	1775
26	15:56:15	19756575	Wave left arm	1810
27	15:56:40	19756600	Wave right arm	1828
28	15:57:56	19756676	Bowing motion	1883
29	15:58:35	19756715	Swing right leg	1910
30	15:59:13	19756753	Bend right knee	1938
31	16:06:40	19757200	One man soaring	2210
32	16:09:35	19757375	Console operations, start	2335
33	16:12:20	19757540	Console operations, end	2452
34	16:13:25	19757605	Flapping arms	2498
35	16:13:47	19757627	Second LIMS reference, arms straight, knees bent 10°	2513
36	16:14:02	19757642	Forceful pushoffs	2524
37	16:14:22	19757662	Normal pushoffs	2538
38	16:14:53	19757693	Worst case soaring, one man	2560
39	16:17:12	19757832	Two men soaring	2660
40	16:18:10	19757890	Astronaut uncoils LIMS cable	2701
41	16:20:30	19758030	Time reference on FMU 2	2758
42	16:22:32	19758152	Coughs, sneezes	2845
43	16:23:30	19758210	Arm movements	2886
44	16:25:15	19758315	Leg lifts	2961
45	16:26:10	19758370	One man soaring	3001
46	16:26:44	19758404	Double somersault	3025
47	16:27:53	19758473	End of telemetry	3074

The middle files, files number 3, 4, and 5, each contain an initial Hollerith identification record followed by several data records (215 in file 3, 311 in file 4, 310 in file 5) of seven 60-bit words containing values of the following parameters (at 6 samples/sec):

<u>Word</u>	<u>Parameter</u>
1	Time of day 228 in seconds
2-4	X, Y, and Z coordinates of astronaut center of mass, cm
5-7	ϕ , θ , and ψ astronaut attitude angles, deg

The files contain the smoothed data for soaring activities 5, 6, and 7 as detailed in tables XIV, XV, and XVI. All records were written by an unformatted write statement; they may be read with an unformatted read with an unformatted read statement.

14
15 DIMENSION C (7)

16
17
18
19 READ (9) C

20 The header record may be printed with an A10 format

21
22 PRINT 100, C
100 FORMAT (1X, 8A10)

23 and the data records printed with an E-format

24
25
26 PRINT 300, C
27 300 FORMAT (1X, 5E25.15)

TABLE XIV.- SOARING ACTIVITY 5 FOR DAY 228

[16:06:43.57 to 16:07:19.77]

Start time	Activity	Duration, sec
6:43.57	Soar to FMU 2	0.5
6:44.07	Hold FMU 2	7.5
6:51.57	Soar	.8
6:52.38	FMU 1	10.39
7:02.77	Soar	2.0
7:04.77	FMU 2	4.5
7:09.27	Soar	1.7
7:10.97	Hold FMU 1	8.8
Summary: 36.2 seconds activity; 4 soarings		

TABLE XV.- SOARING ACTIVITY 6 FOR DAY 228

[16:14:55.57 to 16:15:52.87]

Start time	Activity	Duration, sec
14:55.57	Soar to FMU 2	0.4
14:55.97	Hold FMU 2	5.2
15:01.17	Soar	.7
15:01.87	Hold FMU 1	5.2
15:07.07	Soar	.6
15:07.67	FMU 2	4.5
15:12.17	Soar	.7
15:12.87	FMU 1	6.8
15:19.67	Soar	1.3
15:20.97	FMU 2	5.41
15:26.38	Soar	1.09
15:27.47	FMU 1	5.7
15:33.17	Soar	1.0
15:34.17	FMU 2	6.1
15:40.27	Soar	1.1
15:41.37	Hold FMU 1	11.5
Summary: 57.3 seconds activity; 8 soarings		

TABLE XVI.- SOARING ACTIVITY 7 FOR DAY 228

[16:17:14.37 to 16:18:01.17]

Start time	Activity	Duration, sec
17:14.37	Soar to FMU 2	0.7
17:15.07	Hold FMU 2	7.4
17:22.47	Soar	.7
17:23.17	FMU 1	5.5
17:28.67	Soar	.6
17:29.27	FMU 2	6.7
17:35.97	Soar	.7
17:36.37	FMU 1	15.0
17:51.67	Soar	.4
17:52.07	FMU 2	8.2
18:00.27	Soar	.9
Summary: 46.8 seconds activity; 6 soarings		

The last two files (files 6 and 7) contain 512-word records, file 6 is another header and contains one record with 35 words of alphameric information and 477 words of blanks. It may be read with an unformatted read statement and interpreted by an A10 format; only the first 35 words need to be printed.

DIMENSION D (512)

READ (9) D

PRINT 500, (D(I), I = 1, 35)
500 FORMAT (5X, 7A10)

The 21 records in file 7 may also be read with an unformatted read statement, but should be interpreted with an E-format.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40

DIMENSION D(512)

READ (9) D

PRINT 600, (D(I), I = 1, 510)
600 FORMAT (5X, 5E 20.10)

Each record in file 7 contains 102 contiguous groups of 5 data words; in each group, the words contain the following variable values:

<u>Word</u>	<u>Parameter</u>
1	Time from beginning of year (1973), sec
2	Time from a reference time point, sec (this word is non-T-013 related)
3	OWS rate gyro output from X2 gyro, deg/sec
4	OWS rate gyro output from Y1 gyro, deg/sec
5	OWS rate gyro output from Z3 gyro, deg/sec

These groups of data occur at 12 samples/sec.

Additional Notes on Tape WOO 45
(for CDC user equipment)

Blocking Type C

Record Type S

Control Cards

Record Manager:

FILE, TAPE, BT=C, RT=S, FØ=SQ.

Load set:

LDSET, FILES = TAPE.

D-23662

\$JOB 11:54:10
\$ASS IN TBI
\$NOP *** LIST OF GAILI *****
\$AVF IN 1
\$EXE TPLIST BS

INPUT PARAMETERS ARE: ED SR=1=1

TAPE NO. 1 FILE NO. 1
RECORD 1 LENGTH 710

TC13 EXPERIMENT DATA TAPE W0045. CREATED 19 AUG 1975 FROM TAPE W0031 (CREATED 23 JULY 1975). DERI
VED FROM MSFC TAPE H4982 COVERING DOY 228 FROM 13.19.29 TO 16.27.53. SHORT DATA GAPS FILLED IN BY
LINEAR INTERPOLATION. DC BIAS REMOVED. SUBSEQUENT FILE CONTAINS 512-WORD RECORDS EACH WITH 14 CON
TIGUOUS SETS OF THE FOLLOWING VARIABLES (UNITS). TGMT(SEC) FX1(N) FY1(N) FZ1(N) MX1(N) FVY
(N) MY1(N*M) MZ1(N*M) FX2(N) FZ2(N) MX2(N*M) MY2(N*M) MZ2(N*M) FVX(N) FVY
(N) FVZ(N) MVX(N*M) MVY(N*M) MVZ(N*M) GAM21(DEG)GAM22(DEGGAM31(DEG)GAM32(DEG)GAM41(DEG)GAM4
2(DEG)GAM51(DEG)GAM52(DEG)GAM61(DEG)GAM62(DEG)GAM71(DEG)GAM72(DEG)GAM81(DEG)GAM82(DEG)GAM91(DEG)GAM
92(DEG):.:.:.:.::

***** JOB DONE.
\$WEO LPS

\$\$
\$AVR CI 8
\$END DC

